

IN THE INDUSTRY

threatening and may, induce, at worst, only some slight discomfort. If any obstruction of the lungs is present, cigarette smoking is much more likely to be the cause.

Since it is not a tumor or a virus or a bacteria-caused ailment, but a reaction of lung tissue to the presence of mineral fibers, it can be diagnosed with 100 percent certainty only by biopsy. X-rays may show white lines indicating abnormalities, but they usually look the same as they do in a variety of other illnesses. Dr. Raymond Murphy, an occupational lung specialist at Boston's Faulkner Hospital, calls X-ray interpretation in cases of slight or early asbestosis "one of the most subjective in medicine."

Dr. Barry Levine, a lung specialist at Harvard Medical School, agrees: "It's a rare phenomenon to find true asbestotic disease... A person with

obstructive lung disease (a cigarette smoker's disease such as emphysema) can be read as having an X-ray compatible with asbestosis."

It wasn't until the 50s and 60s that studies were published in England and the United States implicating asbestos as a cause of lung cancer and mesothelioma, a rare cancer of the lining of the lung. But even then, cigarette smoking was far more heavily implicated.

The first study was conducted by Sir Richard Doll of Oxford University, internationally honored for his epidemiological studies conclusively proving cigarette smoking causes lung cancer. Doll studied workers with at least 20 years exposure to the mineral in textile plants, and found the disease was experiencing 10 times the lung cancer deaths of non-asbestos workers at the same age.

Selikoff tracked down in the 60s most of the workers who had been carried on the rolls of an asbestos workers union, and found by 1973 the group had experienced a death

rate 50% greater than the average white male.

In retrospect, these studies were seriously flawed, even primitive by current scientific standards. To begin with, the comparison to the average white male provided an inadequate "control"—a group sufficiently similar in socio-cultural characteristics as the cohort studied so that any sharp difference in experience can be logically related to the factor, asbestos in this instance, under study. Even in the 40s and 50s, white collar workers were much less likely to be smokers than blue collar workers. Moreover, the general health of the average white male was much more likely to be better, because of access to better nutrition and medical care, than that of black workers who were disproportionately represented in the asbestos trades. Further, almost all the World War II workers had either been too old to be drafted, or even more significant, unable to pass the physical.

Another difficulty with the studies, little appreciated at the time but seen now as very disturbing was the impossibility of assembling complete cohorts, groups with all of the workers exposed in a particular workplace. Up to one third were missing in the groups studied by Selikoff 20 years later. Moreover, the assumption was made that the three different types of asbestos, chrysotile, crocidolite and amosite, although different in their mineral characteristics, the length and diameter of the individual fibers, would have the same biological effects in humans.

Even then, the Selikoff studies did make the central point that asbestos, while dangerous, was infinitely more dangerous in combination with cigarette smoking. Selikoff's published studies of the time estimated the increased risk as being 80 to 90 times higher. "(H)ad it not been for cigarette smoking, many of these deaths would have been avoided," Selikoff wrote in one paper.

(In the next edition of Asbestos Abatement Magazine, Mr. Bennett will discuss the work by Dr. Selikoff more closely and trace the development of the asbestos controversy to present times.)



MICRO ANALYTICAL

ANALYTICAL MICROSCOPY SERVICES

*Specializing in Asbestos
Analysis of air filter samples
by Electron Microscopy*

State-of-the-art facilities for
only the very best in Pollution
Analysis

- Cambridge S-250 40 KV Scanning Electron Microscope
- Ortec Systems 5000 Energy Dispersive X-Ray
- JEOL 200CX Analytical Transmission Electron Microscope
- X-Ray Diffraction
- Particle Size Distribution
- Sub-Micron Foreign Particle Identification

For more information

Phone (904) 375-3288 or
write P.O. Box 1154, Gainesville, FL 32602